

REMARKS

Introduction

This Amendment is in response to an Office Action dated October 16, 2003. Claims 18-21, 23, 27 and 29-32 were in the application. Claims 19 and 31 were deemed to be allowable if rewritten in independent form. Claims 18, 20, 21, 23, 27, 29 and 30 were rejected under 35 U.S.C. §102, and claim 32 was rejected under 35 U.S.C. §103. In addition, claims 20, 21, 23, 27 and 29-32 were rejected under the judicially created doctrine of obviousness-type double patenting and claim 31 has been objected to for formalistic reasons.

By this Amendment, applicants have amended claim 27. Applicants have also rewritten allowable claims 19 and 31 in independent form, have addressed the formalistic objections to claim 31, and have added new dependent claims 33 and 34, which are similar to previous claims 19 and 31 prior to their being rewritten in independent form by the present Amendment.

Applicants are also submitting, concurrently herewith, a Declaration of Mr. Satoshi Shinada in support of the patentability of the claims as amended. Applicants are further submitting, concurrently herewith, a Terminal Disclaimer to overcome the obviousness-type double patenting rejections. Accordingly, claims 18-21, 23, 27 and 29-34 are presently in the application. Claim 27, and claims 19 and 31 are independent.

Allowable Subject Matter

Applicants note with appreciation that claims 19 and 31 were deemed allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim. By this Amendment, applicants have rewritten claims 19 and 31 in independent form,

including the limitations of the base claim (and attended to the objections to claim 31 as described below). This rewriting of the claims to include the limitations of the base claim is merely formalistic, and is not a narrowing amendment. Accordingly, applicants submit that claims 19 and 31, as amended, are allowable.

Objections To The Claims

In the Office Action, claim 31 was objected to because of certain informalities. By this Amendment, applicants have amended claim 31 in accordance with the suggestions set forth in the Office Action and overcome the objections. Accordingly, applicants submit that the objections to claim 31 have been overcome, and applicants respectfully request that the objections to claim 31 be withdrawn.

Double Patenting Rejections

In the Office Action, claims 20, 21, 23, 27 and 29-32 were rejected under the judicially created doctrine of obviousness-type double patenting. Specifically, the Office Action contends that those claims are unpatentable over claims 1-21 of U.S. Patent No. 6,019,465 to Shinada, et al.

To expedite prosecution of the present application, and in no way conceding the correctness of the Office Action's contention of double patenting, applicants submit concurrently herewith a Terminal Disclaimer in accordance with 37 C.F.R. § 1.321(c) to overcome the obviousness-type double patenting rejections. Accordingly, applicants submit that the rejections to claims 20, 21, 23, 27 and 29-32 under obviousness-type double patenting have been overcome, and applicants respectfully request that those rejections to the claims be withdrawn.

Rejections Under 35 U.S.C. § 102(b)

In the Office Action, claims 18, 20, 21, 23, 27, 29 and 30 were rejected under 35 U.S.C. § 102(b) based on European application No. 0 532 302 A2 to Danzuka et al.

Danzuka discloses an ink cartridge having eight recording heads. The eight recording heads are for inks of colors light black, dark black, light cyan, dark cyan, light magenta, dark magenta, light yellow and dark yellow. Danzuka does not disclose ink chambers being collectively integrally formed within the ink cartridge. In fact, Danzuka appears to focus on other aspects of ink jet recording; Danzuka is silent as to the formation of the ink chambers in the ink cartridge. See Danzuka at Fig. 4 and at Specification, at page 4, lns. 6-23.

Claim 27, as amended, of the present application is directed to an ink cartridge comprising, *inter alia*, a plurality of ink storage chambers, the plurality consisting of exactly five ink storage chambers, storing ink of exactly five different colors. All of the ink storage chambers are collectively integrally formed in the ink cartridge, and none of the ink storage chambers store black ink. The ink storage chambers store light cyan ink, deep cyan ink, light magenta ink, deep magenta ink and yellow ink, each ink storage chamber has an ink supply port, and all ink supply ports are aligned on one straight line.

Applicants respectfully submit that Danzuka does not disclose all of the features as claimed by claim 27, as amended, of the present application. For example, Danzuka does not disclose a plurality of ink storage chambers consisting of exactly five ink storage chambers, storing ink of exactly five different colors. In contrast, Danzuka describes a cartridge having eight ink supply chambers. In addition, Danzuka does not describe an ink cartridge wherein

none of the ink storage chambers store black ink. In stark contrast, Danzuka describes two of the chambers as containing black ink (both light and dark). Danzuka at page 4, lns. 6-23.

Further, Danzuka does not describe the ink storage chambers as being collectively integrally formed in the ink cartridge. While the Office Action contends that each of the light colored ink tanks (9-1) of Danzuka are integrally formed with their corresponding dark colored counterparts (9-2), this arrangement does not satisfy the requirement of the ink storage chambers being collectively integrally formed in the ink cartridge. In stark contrast, instead of ink tanks of Danzuka being collectively integrally formed in the ink cartridge, Danzuka describes "four sets of color ink reservoirs." Danzuka at page 4, ln. 18. Furthermore, Danzuka does not disclose all of the ink supply ports being aligned on one straight line. In fact, while the Office Action contends that Danzuka discloses a particular alignment of the ink supply ports, applicants do not find any teaching of the particular alignment of ink supply ports in Danzuka. For example, the only figure of Danzuka that illustrates an ink cartridge is FIG. 4, and that figure does not show the ink supply ports, nor their particular alignment configuration.

Accordingly, applicants respectfully submit that Danzuka does not disclose all the features as recited by claim 27, as amended, of the present application. Accordingly, applicants respectfully request withdrawal of the rejection to claim 27, as amended, under 35 U.S.C. §102(b) based on Danzuka.

Claims 18, 20, 21, 23, 27, 29, and 30, as amended, depend from claim 27. Accordingly, applicants submit that claims 18, 20, 21, 23, 27, 29, and 30 are allowable over Danzuka, at least for depending from allowable claim 27 for reasons discussed above with regard to the rejection of claim 27. Accordingly, applicants respectfully request that the

rejections to claims 18, 20, 21, 23, 27, 29, and 30 under 35 U.S.C. §102(b) based on Danzuka be withdrawn.

Declaration of Satoshi Shinada

Applicants have also submitted, concurrently herewith, a Declaration of Satoshi Shinada, an employee of the assignee of the present application, in support of the patentability of the claims of the application.

In the Declaration, Mr. Shinada states that he believes that the claimed ink cartridge is novel and non-obvious in view of the cited references.

Mr. Shinada states that while the quality of full color printing is typically improved by increasing the number of kinds of color inks to more than five inks, as is described in the cited references, the use of more than five ink colors as described in the cited references leads to certain inefficiencies.

In addition, while conventional wisdom and the cited references describe and express a preference for a greater number of colors and corresponding ink chambers ink chambers, full color printing may be achieved with the five colors of yellow, light cyan, dark cyan, light magenta and dark magenta, as claimed by the present application.

Mr. Shinada states that it has been determined by applicants that generally, the additional color (non-black) inks used by the cited references, beyond the five color (non-black) inks claimed by the present application, are used significantly less often than are the five color inks and corresponding ink chambers claimed by the present application.

Because of this inequality of use amongst the different colors and corresponding ink chambers, an inefficiency is caused when more than five colors are used in conjunction with

a unitary integral ink cartridge. Specifically, ink colors beyond the five color (non-black) inks that are claimed are used at a lesser rate than those that are claimed. Because, with a unitary integrated ink cartridge, the cartridge is typically replaced when any one of the ink chambers becomes empty, ink chambers for colors beyond the five claimed by the present application would tend to have some residual ink when the ink cartridge was must be removed, thus resulting in an inefficiency.

Another drawback of using more than the claimed number of color ink chambers, as is done by the cited references, is that such an ink cartridge typically must be made larger to accommodate the larger number of chambers. A larger ink cartridge results in inefficiencies of both storage and printer design.

Additionally, Mr. Shinada also states that another benefit of the claimed ink cartridge as compared to the cartridges described by the cited references is that the claimed cartridge does not contain a chamber for black ink, as do the cartridges described in the cited references.

A benefit of not including a chamber for black ink, and thus employing a separate cartridge for black ink, is that the black ink cartridge may be replaced separately and independently of the claimed color ink cartridge. Such a scenario is beneficial because the black ink is typically consumed at a much greater rate than the other color inks during typical printing operations.

Accordingly, due to these novel, non-obvious and beneficial differences from the cartridges described in the cited references claimed by the present application, Mr. Shinada believes that the claimed invention is patentable over the cited references.

Rejections Under 35 U.S.C. § 103(a)

In the Office Action, claim 32 was rejected under 35 U.S.C. §103(a) based on a hypothetical combination of Danzuka and U.S. Patent No. 4,672,432 to Sakurada et al.

Sakurada describes an ink jet printing system including eight main tanks for the colors high-density black, low-density black, high-density yellow, low-density yellow, high-density cyan, low-density cyan, high-density magenta and low-density magenta. Sakurada at FIG. 2. Sakurada also describes another system having six main ink tanks for the colors black, yellow, high-density cyan, low-density cyan, high-density magenta and low-density magenta. Sakurada at FIG. 5. Both of these described embodiments include more than five ink tanks. Further, both embodiments include tanks for black ink.

Further, Sakurada describes ink tanks having nozzles at the side of the cartridge. See Sakurada at FIGs. 2 and 5. While the Office Action contends that Sakurada describes ink supply ports are disposed at a bottom of an ink cartridge when said ink cartridge is positioned within the ink-jet recording apparatus, applicants respectfully disagree. Specifically, with reference to FIG. 6 of Sakurada, it can be seen that the nozzles of Sakurada are positioned at a side of the ink cartridge, and not the bottom of the cartridge. Indeed, from the orientation of the paper as illustrated in FIG. 6 of Sakurada, the nozzles of Sakurada needs to be at a side of the ink tank when ink is applied to the paper. The views of the ink tank of FIGs. 2 and 5 of Sakurada also depict the nozzles at a side of the ink tank (a bottom portion of the side of the ink tank, but a side nonetheless).

Claim 32 depends from claim 27, as amended, of the present application. As stated above with respect to the rejections under 35 U.S.C. § 102, applicants submit that

Danzuka does not describe all of the limitations recited by claim 27. For example, as described above, Danzuka does not describe a plurality of ink storage chambers consisting of exactly five ink storage chambers, storing ink of exactly five different colors. In addition, Danzuka does not describe an ink cartridge wherein none of the ink storage chambers store black ink.

Sakurada fails to cure these deficiencies. While claim 27, as amended, of the present application requires a plurality of ink storage chambers consisting of exactly five ink storage chambers, storing ink of exactly five different colors, in contrast, Sakurada describes cartridges having eight and six ink tanks. Further, while claim 27 requires that none of the ink storage chambers store black ink, in stark contrast, Sakurada describes the ink tanks as containing black ink.

Applicants submit that neither Danzuka nor Sakurada, taken alone, or in a hypothetical combination proposed in the Office Action, describe all of the limitations of claim 27, as amended, of the present application. Accordingly, for these reasons, applicants submit that claim 32 is allowable, at least for depending from allowable claim 27.

Moreover, applicants submit that claim 32 is also patentable for additional reasons. For example, claim 32 requires that all of the ink supply ports be disposed at a bottom of the ink cartridge when said ink cartridge is positioned within the ink-jet recording apparatus. As described above, Sakurada does not describe ink supply ports on a bottom of a cartridge, but instead, Sakurada depicts ink nozzles at a side of the ink tanks.

Accordingly, for these additional reasons, applicants submit that claim 32 is patentable over both Danzuka and Sakurada, either taken alone, or in the hypothetical combination proposed by the Office Action. Accordingly, applicants respectfully request

withdrawal of the rejection to claim 32 under 35 U.S.C. §103(a) based on a hypothetical combination of Danzuka and Sakurada.

New Claims

By this Amendment, applicants have added new dependent claims 33 and 34, which are similar to previous claims 19 and 31 prior to their being rewritten in independent form by the present amendment. Because new claims 33 and 34 each depend from claim 27, applicants submit that these claims are both allowable, at least for reasons discussed above with respect to the rejection to claim 27.

CONCLUSION

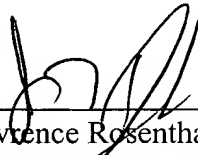
Accordingly, applicants respectfully submit that all of the claims presently in the application (i.e., 18-21, 23, 27 and 29-34) are in condition for allowance. If the examiner cannot issue an immediate Notice of Allowance, the Examiner is respectfully requested to contact the undersigned attorney to discuss outstanding issues.

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Authority is hereby given to charge any additional needed fees to Deposit

Account No. 19-4709.

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